

FIG. 1

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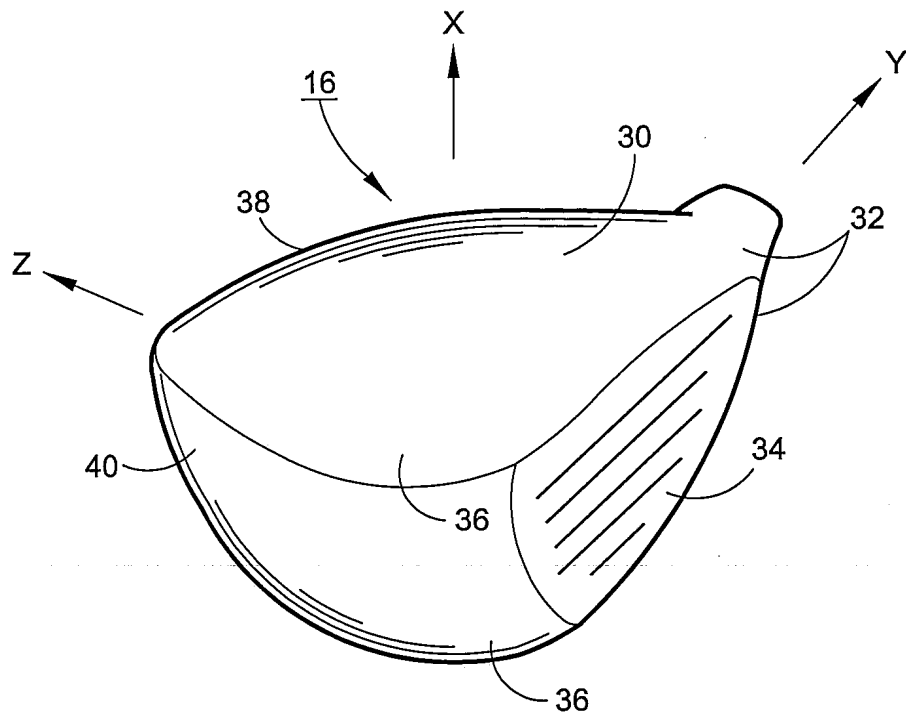


FIG. 2

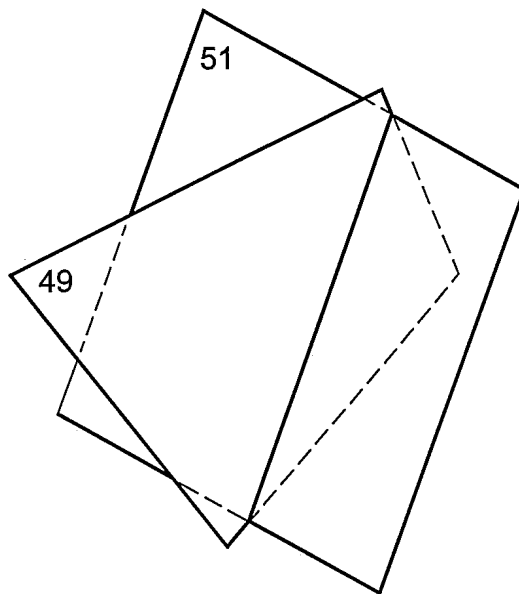


FIG. 2A

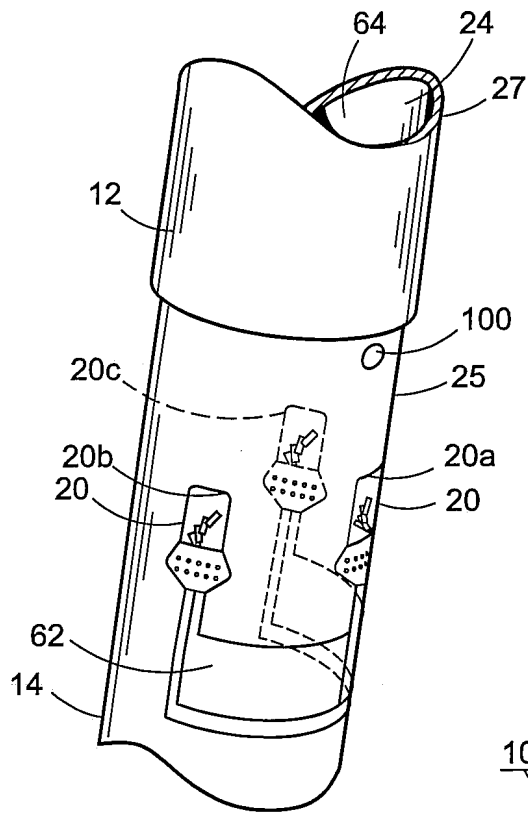


FIG. 4

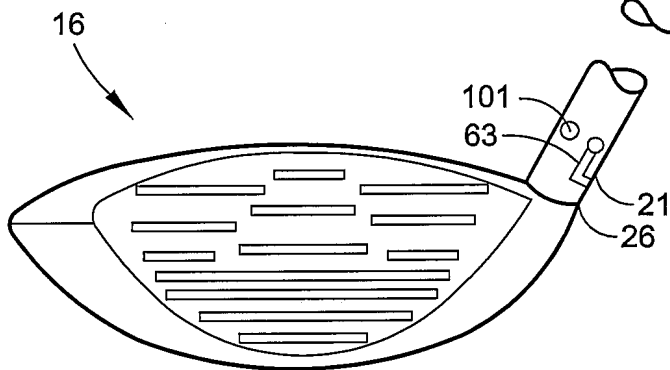
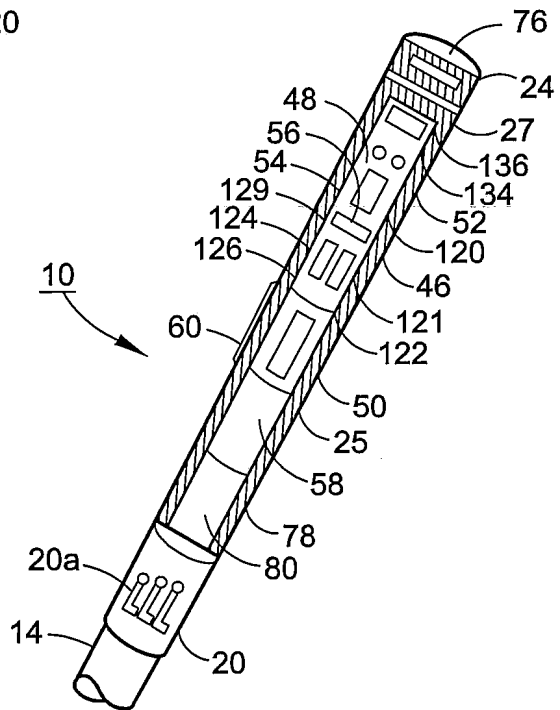


FIG. 3

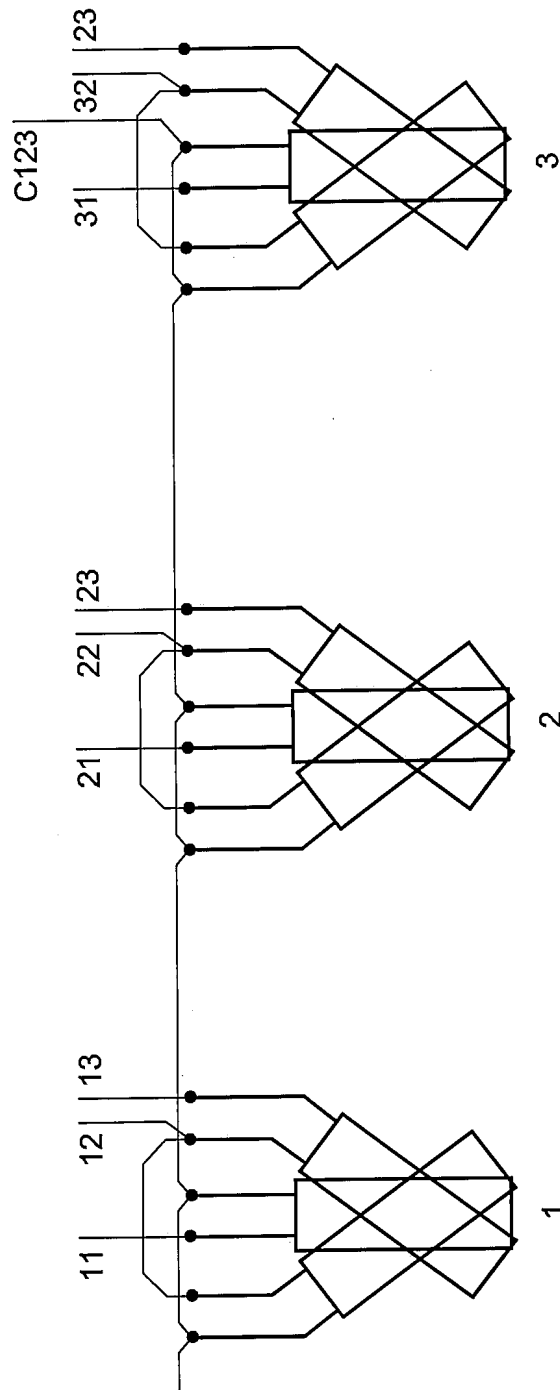


FIG. 5

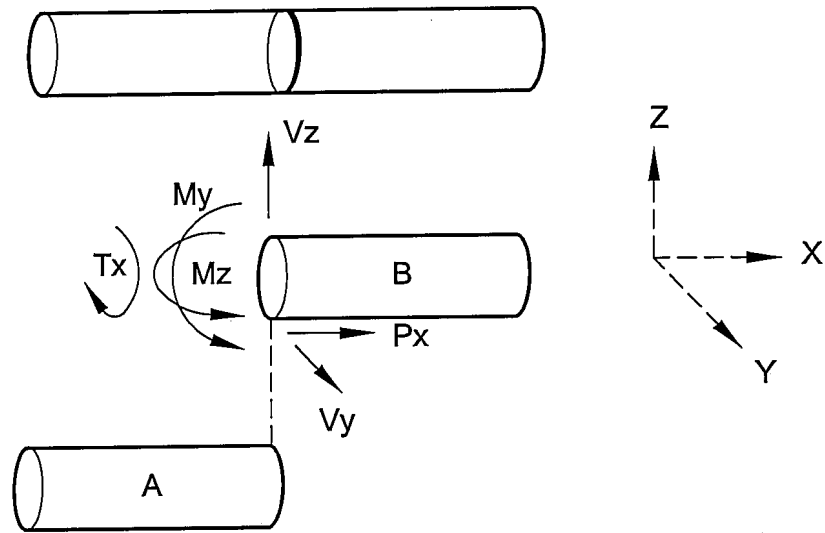


FIG. 6

$$\begin{bmatrix} P_x \\ V_y \\ V_z \\ M_y \\ M_z \\ T_x \end{bmatrix} = \begin{bmatrix} EA/3 & EA/3 & EA/3 & 0 & 0 & 0 \\ 0 & 0 & 0 & KAG/\sqrt{3} & -KAG/\sqrt{3} & 0 \\ 0 & 0 & 0 & -KAG3 & -KAG3 & 2*KAG/3 \\ EI/(Ro*\sqrt{3}) & EI/(Ro*\sqrt{3}) & 0 & 0 & 0 & 0 \\ -EI/Ro & -EI/Ro & -2*EI/Ro & 0 & 0 & 0 \\ 0 & 0 & 0 & GJ(3*Ro) & GJ(3*Ro) & GJ(3*Ro) \end{bmatrix} \begin{matrix} e1 \\ e2 \\ e3 \\ g1 \\ g2 \\ g3 \end{matrix} \quad X$$

FIG. 7

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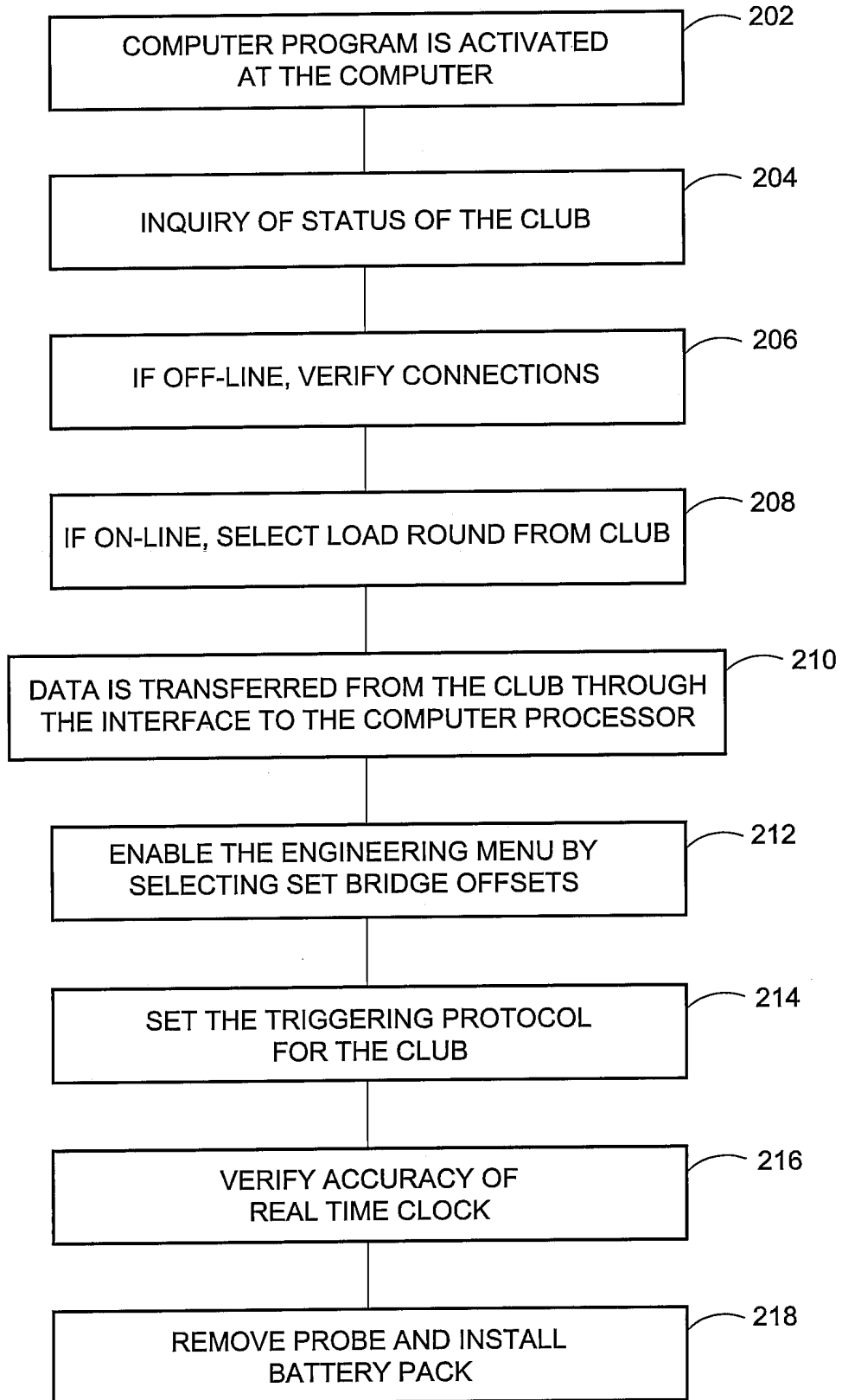


FIG. 8a

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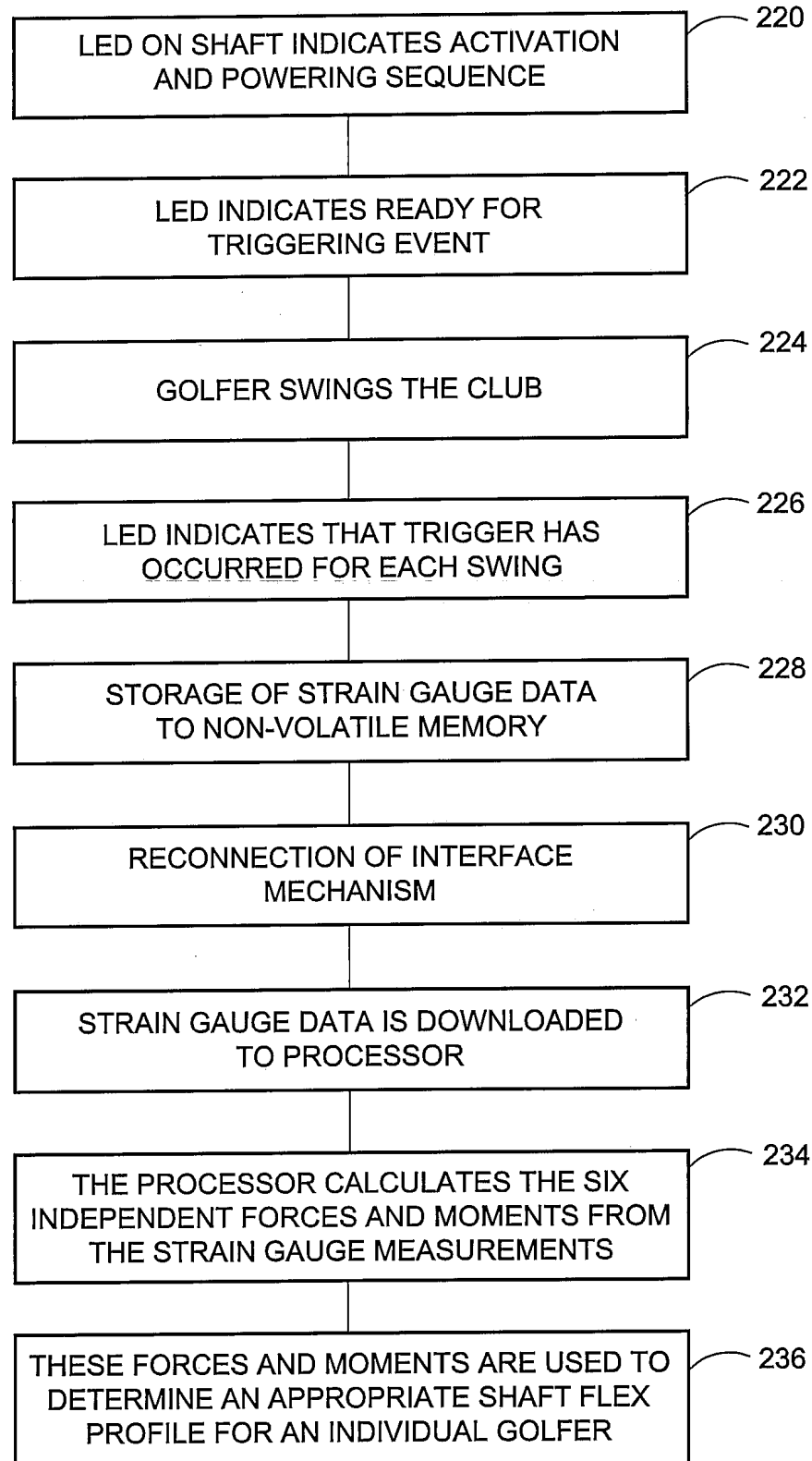
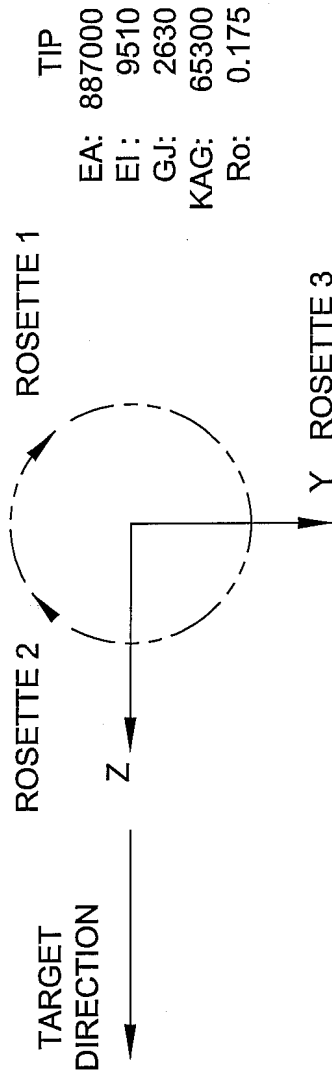


FIG. 8b

CALLAWAY GOLF COMPANY
OBD II EXPORTED DATA FILE
CLUB ID

8 DEGREE HAWK EYE DRIVER
WITH L STRONG SHAFT
OBD 11 #7
SAMPLE RATE = 100/S/CH.



TIP
EA: 887000
EI: 9510
GJ: 2630
KAG: 65300
Ro: 0.175

TIME	BUTT e1	BUTT e2	BUTT e3	BUTT g1	BUTT g2	BUTT g3	TIP e1	TIP e2	TIP e3	TIP g1	TIP g2	TIP g3	STRESS RESULTANTS AT BUTT						STRESS RESULTANTS AT TIP																
	s=0	c=1	s=0	c=2	s=0	c=3	s=0	c=7	s=0	c=10	s=0	c=10	Px	Vx	Vz	Mx	My	Mz	Tx	Px	Vx	Vz	Mx	My	Mz	Tx	Px	Vx	Vz	Mx	My	Mz			
0	60.201	49.923	117.47	18.749	-23.924	-16.503	79.184	118.09	11.12	-21.783	-27.952	-30.843	-1.807116	-1.99008	-0.75236	-0.6092246	-35.4286	-0.28181	91.20648	-0.30381	-0.33981	1.22067	1.365419	-0.40368	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189	
0.01	69.99	93.972	-137.04	14.843	-29.783	-38.962	66.413	104.32	152.52	-8.2891	-8.6747	-3.8554	16.252412	-1.08903	-1.70267	-1.4215241	-44.9723	-0.70073	95.27947	-0.01899	-0.49365	0.646779	-0.6157	8.50098	-0.17189	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189
0.02	64.673	74.395	-92.994	22.655	-14.159	-22.362	66.07	66.446	-2.41	-10.217	-20.241	-3.8554	10.235078	-1.81519	-1.64987	-0.6092246	-35.4287	-0.70073	95.27947	-0.01899	-0.49365	0.646779	-0.6157	8.50098	-0.17189	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189
0.03	65.096	103.76	-127.25	22.655	-16.112	-22.362	66.07	66.446	-2.41	-10.217	-20.241	-3.8554	10.235078	-1.81519	-1.64987	-0.6092246	-35.4287	-0.70073	95.27947	-0.01899	-0.49365	0.646779	-0.6157	8.50098	-0.17189	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189
0.04	74.884	54.817	-117.47	19.725	-14.159	-22.362	66.07	66.446	-2.41	-10.217	-20.241	-3.8554	10.235078	-1.81519	-1.64987	-0.6092246	-35.4287	-0.70073	95.27947	-0.01899	-0.49365	0.646779	-0.6157	8.50098	-0.17189	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189
0.05	114.04	89.078	-161.52	23.631	-12.206	-21.385	79.184	32.018	1.0328	-8.2891	-8.6747	-3.8554	16.252412	-1.08903	-1.70267	-1.4215241	-44.9723	-0.70073	95.27947	-0.01899	-0.49365	0.646779	-0.6157	8.50098	-0.17189	-0.01899	-0.50424	1.220702	7.352969	-0.17189	-0.01699	-0.50424	1.220702	7.352969	-0.17189
0.06	65.096	113.55	-141.94	25.584	-20.995	-14.159	68.858	93.988	-23.067	-6.3614	-14.458	-11.566	9.029676	-2.18097	-0.91073	-0.5511355	-47.4856	-0.10149	43.36348	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.07	94.462	103.78	-132.15	23.631	-6.3473	-16.503	99.841	38.904	7.9184	5.2048	12.53	-15.36	16.253712	-1.40368	-1.3595	0.5511355	-47.4856	-0.10149	43.36348	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.08	69.99	79.289	-161.52	18.749	-25.877	-21.385	27.542	45.789	35.461	9.0602	-14.458	-19.277	-3.01286	-2.08953	-0.96352	0.5511355	-47.4856	-0.10149	43.36348	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.09	123.83	89.078	-127.25	30.487	-16.112	-22.362	27.542	45.789	35.461	9.0602	-14.458	-19.277	-3.01286	-2.08953	-0.96352	0.5511355	-47.4856	-0.10149	43.36348	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.1	74.884	79.289	-161.52	25.584	-13.183	-9.6673	27.542	45.789	35.461	9.0602	-14.458	-19.277	-3.01286	-2.08953	-0.96352	0.5511355	-47.4856	-0.10149	43.36348	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.11	94.462	108.68	-166.41	34.373	-16.112	-30.174	30.985	100.87	18.247	-4.4337	12.53	-25.06	11.807362	-2.36386	-1.12506	0.6418812	-55.0234	-0.15487	27.07686	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.12	123.83	74.395	-146.83	20.702	-14.159	-16.456	37.871	32.018	21.69	-0.5783	6.7469	11.566	12.64317	-1.6323	-1.7473	-2.9302412	-50.5002	-0.15487	27.07686	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.13	114.04	123.34	-166.41	34.373	-9.2768	-32.127	24.1	38.904	18.247	-14.072	-16.385	-26.988	17.45862	-2.04361	-1.83465	-0.551254	-56.5045	-0.24374	12.82602	-0.49364	-0.89796	0.464473	-5.55687	-0.24315	-0.17541	0.572497	-7.61464	-0.25588	-0.17541	0.572497	-7.61464	-0.25588			
0.14	84.673	64.606	-166.41	32.42	-19.042	-32.127	24.1	38.904	18.247	-14.072	-16.385	-26.988	17.45862	-2.04361	-1.83465	-0.551254	-56.5045	-0.24374	12.82602	-0.49364	-0.89796	0.464473	-5.55687	-0.24315	-0.17541	0.572497	-7.61464	-0.25588	-0.17541	0.572497	-7.61464	-0.25588			
0.15	153.19	69.5	-161.52	22.655	-14.159	-9.6673	68.858	87.103	7.9184	-16	-16.385	-19.277	15.04782	-1.72375	-1.43871	-0.6092246	-35.4287	-0.70073	95.27947	-0.01899	-0.49364	0.646473	-5.55687	-0.24315	-0.17541	0.572497	-7.61464	-0.25588	-0.17541	0.572497	-7.61464	-0.25588			
0.16	94.462	54.817	-166.41	24.608	-8.3003	-12.597	65.413	73.332	18.247	-8.2891	-8.6747	-3.8554	-4.214226	-1.54087	-1.12193	-2.3498426	-49.4055	-0.24374	12.82602	-0.49364	-0.89796	0.464473	-5.55687	-0.24315	-0.17541	0.572497	-7.61464	-0.25588	-0.17541	0.572497	-7.61464	-0.25588			
0.17	60.201	89.078	-146.83	36.326	-6.3473	-25.268	92.958	87.103	12.738	9.0602	-14.458	-19.277	15.04782	-1.72375	-1.43871	-0.6092246	-35.4287	-0.70073	95.27947	-0.01899	-0.49364	0.646473	-5.55687	-0.24315	-0.17541	0.572497	-7.61464	-0.25588	-0.17541	0.572497	-7.61464	-0.25588			
0.18	84.673	128.23	-166.41	40.232	-6.3473	-20.409	86.07	65.003	21.69	5.2048	-8.6747	-3.8554	11.437278	-1.8099	-2.01946	2.581825	-56.0278	-0.175184	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224				
0.19	123.83	138.02	-166.41	18.749	-14.159	-32.127	51.642	45.789	1.0328	-8.2891	2.8915	-15.422	35.51718	-1.54085	-1.86108	0.841107	-51.0638	-0.357981	29.11246	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.2	84.673	93.972	-166.41	21.678	-24.901	-13.573	37.871	32.018	21.69	-0.5783	6.7469	11.566	3.00931	-2.18097	-0.64672	0.5511948	-52.5104	-0.21635	27.07686	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.21	133.62	113.55	-107.68	32.42	-21.971	-17.479	37.871	45.789	12.738	12.916	-12.53	-25.06	34.31454	-2.54678	-1.2275	-1.189464	-47.4364	-0.09139	20.96927	-1.25316	-0.945745	0.246426	-5.93075	0.059874	-0.12059	1.112678	3.048852	-0.35537	-0.12059	1.112678	3.048852	-0.35537			
0.22	74.884	54.817	-107.68	12.89	-27.63	-24.315	92.958	128.42	92.958	114.65	97.431	-21.708	11.437278	-1.8099	-2.01946	2.581825	-56.0278	-0.175184	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224				
0.23	94.462	96.867	-146.83	18.749	-23.924	-39.939	96.398	114.65	97.431	-21.708	-12.53	-23.132	11.437278	-1.8099	-2.01946	2.581825	-56.0278	-0.175184	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224				
0.24	65.096	118.44	-141.94	21.678	-10.253	-14.159	51.642	87.103	7.9184	12.916	-12.53	-23.132	10.232616	-1.49511	-1.09553	3.1619457	-47.998	-0.04063	43.36348	-1.0633	-0.55908	1.002584	6.67918	0.01738	-0.33981	0.572497	-7.61464	-0.25588	-0.33981	0.572497	-7.61464	-0.25588			
0.25	94.462	74.395	-171.3	14.843	-21.971	-18.458	44.756	25.132	-12.738	-4.337	2.8915	-11.566	43.948392	-2.36386	-1.12506	0.6418812	-55.0234	-0.15487	27.07686	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.26	94.462	74.395	-171.3	14.843	-21.971	-18.458	44.756	25.132	-12.738	-4.337	2.8915	-11.566	43.948392	-2.36386	-1.12506	0.6418812	-55.0234	-0.15487	27.07686	0.360751	-0.50426	-1.91189	-6.67918	0.08843	-0.06575	0.788513	-11.3565	-0.16224	-0.06575	0.788513	-11.3565	-0.16224			
0.27	55.307	84.184	-107.68	19.725	-14.159	-21.385	82.627	52.675	35.461	-10.217	14.458	3.8554	7.825506	-1.58655	-1.30688	1.7115734	-36.4314	-0.20565	16.89735	-0.39873	-0.945745	0.246426	-5.93075	0.059874	-0.12059	1.112678	3.048852	-0.35537	-0.12059	1.112678	3.048852	-0.35537			
0.28	114.04	123.34	-166.41	34.373	-9.27																														

